

The University of Iowa

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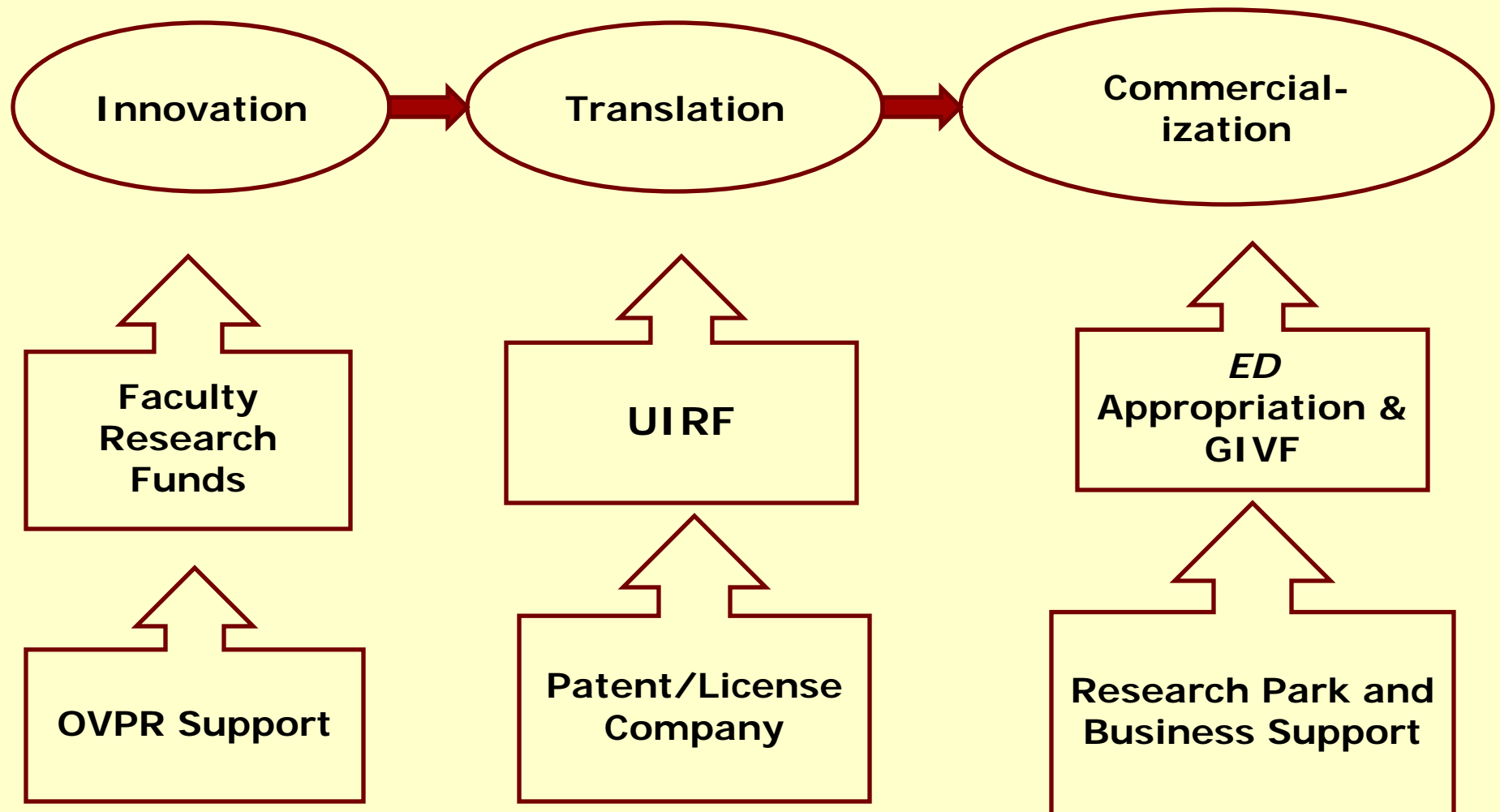
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Terpenoid Pharmaceuticals

Goals of Today's Discussion

- Impact of GIVF/Battelle funding
- Leveraging to create a culture change
- Major successes
- Increasingly promising and diverse pipeline
- New initiatives
- Impact of budget reductions

UI Economic Development Paradigm



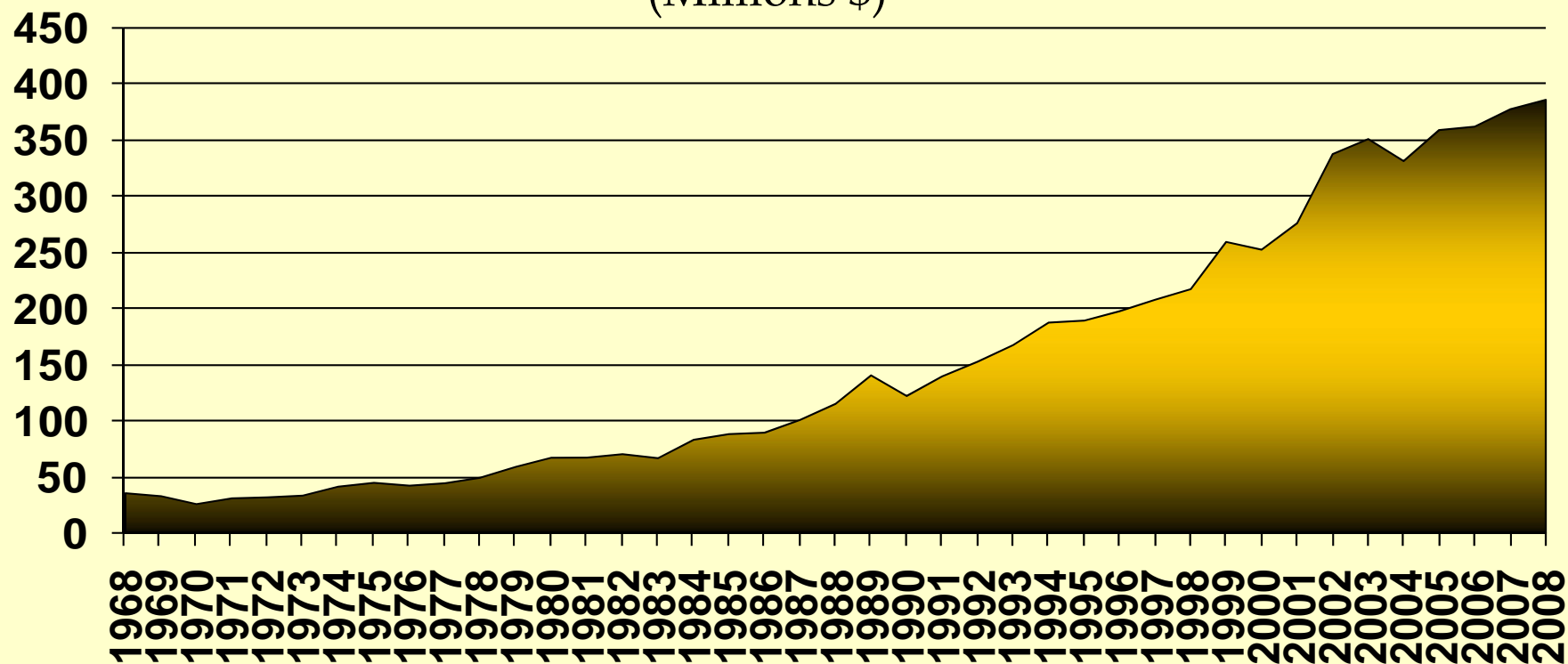
Where We Were

- Traditional technology transfer
- Modest engagement by faculty
- Predominantly focused on licensing
- Inadequate wet lab infrastructure for start-up companies
- Limited support for commercial activity

The University of Iowa

External Funding FY1968-FY2008

(Millions \$)



2006 AUTM Survey Results

University	Sponsored Research Funding (Millions)	Gross License Revenue (Millions)	Big 10 License Revenue Rank	Faculty Numbers	Start Up Companies Formed	Patents Issued
Illinois (Chicago & Urbana)	\$808,374,000	\$10,222,735	6	4,200	9	41
Indiana	\$380,815,996	\$6,726,733	7	1,832	2	9
Iowa	\$346,357,000	\$16,912,938	4	2,002	4	22
Michigan	\$796,963,386	\$20,438,727	3	5,129	9	79
Michigan State	\$358,097,000	\$4,182,565	9	2,573	4	21
Minnesota	\$594,877,000	\$56,193,050	1	2,412	3	28
Ohio State	\$652,328,819	\$947,000	11	3,119	5	27
Penn State	\$656,634,000	\$1,348,400	10	3,071	4	37
Purdue	\$388,500,000	\$3,823,581	8	2,365	14	32
Wisconsin	\$831,895,000	\$42,363,611	2	3,065	7	69

GIVF Supported Initiatives (\$7.3M)

- Operations support for IOWA Centers for Enterprise
- Gap funds for new UI spin-out opportunities
- New life sciences incubator facility
- cGMP facilities for Center for Biocatalysis and Bioprocessing
- Facilities for Optherion (leased by the company)
- Research Park business & infrastructure development
- Entrepreneurs-in-residence to advance UIRF commercialization efforts

Battelle Supported Initiatives (8.41M)

➤ \$2,000,000

- Endowed entrepreneurial professorship- and/or to attract world-class, entrepreneurial talent
 - Dr. Greg Hageman, Professor in Ophthalmology and Visual Sciences & Ophtherion
 - Dr. Bernd Fritzscht, Chair of Biological Sciences

➤ \$2,720,000

- To develop a new Technology Incubation Center
 - Provided funding for BioVentures
 - Renovation of space at University of Iowa Research Park for California based start up company

➤ \$3,690,000

- Development of core platforms through “Gap/Seed Fund” program.
 - 8 seed grant programs awarded that have resulted in 6 new spin out companies including Santos and Exemplar
 - Funds provided for the purchase and renovation of research space at the Research Park

2004/05 GIVF Begins

2006 Battelle Report
& Funding

IOWA Centers for
Enterprise Formed

Entrepreneur-in-
Residence Program
Established

Partnership with Ryan

JPEC Establishes
Entrepreneurial Ventures
Group & Boot Camps

2004

2006

2008

- Retention of Dr. Hageman (Battelle endowed chair)
- Optherion established in 2005
- Purchased infrastructure for cGMP production facility
- Purchased building for Dr. Hageman's research space
- 8 GIVF seed grants funded
- 8 Battelle platform grants funded

- BioVentures Center opens in December 2008
- Series A funding for Optherion = \$37M
- 8 GIVF Seed Grants created 7 companies
 - Bio::NEOS, iOptics, RepGenix, Terpenoid Therapeutics, Exemplar Genetics, ASL Analytical and Voltesla
- 8 Battelle Platform Grants created 5 companies
 - SantosHuman Inc., RepGenix, QI2, Performex and Exemplar Genetics
- JPEC provides programming/outreach across the state through EVG, and entrepreneurial boot camps

University of Iowa Research Park

- **Companies in the Research Park:**
 - Workforce from 29 counties, 91 communities
 - Payroll exceeding \$100 million
 - 1,962 employees in 2008 (up by 10%)
 - Employees pay almost \$6 million/year in Iowa income tax

- **New BioVentures Center provides space, services for life science start-ups:**
 - 20 wet labs, 16 offices, plus shared support space
 - First six companies occupy approx. 50% of space
 - Staff links the start-ups to the business, strategic, marketing and technical assets of the University and the

Battelle Core Platform Award Recipients and Companies Formed

Six of the initial eight research investments of Battelle funding in 2004 resulted in company formation:

- **SantosHuman**, Dr. Karim Abdel-Malek, College of Eng.– Computer model of human performance
- **RepGenix**, Dr. Gregory Leno, College of Medicine – Cell therapy for human disease
- **Performex**, Dr. Richard Shields, College of Medicine – Bone loss/injury prevention
- **QI2**, Dr. Edwin Van Beek, College of Medicine – Medical imaging database management
- **Exemplar Genetics**, Dr. Michael Welsh, College of Medicine – Animal models of human disease
- **Newco**, Dr. Susan O'Dorisio, College of Medicine – Peptides for treating solid tumors (1st qtr 2009)

Impact of 2009 Reversions (\$6856)

Economic Development Appropriation (after cuts) is 264,325

- Operation of **University Research Park and Technology Incubation Center**
- Operation of one important “magnet Laboratory” – **Center for Advanced Drug Development (CADD)**

Our success has been based on leveraging other resources to create an effective culture of innovation at The University of IOWA.

Impact of 20% Budget Cuts – GIVF (deduction of \$405,000)

- **Loss of momentum**
 - Inadequate staffing – results in the inability to support the formation & sustainability of start-ups
 - Inability to provide gap funding for new UI spin-out opportunities
 - Inability to support entrepreneurs-in-residence – a successful program to advance commercialization efforts
- **Impact to the state**
 - Slower development on new company formation = jobs

With Continued Support A Look into the Future

- Enhance recruitment and retention of excellent faculty
- Diversified technologies in strong pipeline
- Growth in company formation
- IA Wind – partnership with IDED, ISU, UNI, Community Colleges and industry
- EPSCoR – statewide science and technology infrastructure and workforce development program



From Invention to Incorporation:

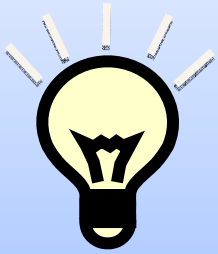
Startup Company Formation at the University of Iowa

*In Collaboration with the State of Iowa,
The Iowa Dept of Economic Development,
Faculty, Entrepreneurs, Investors,
and Federal Funding Agencies*

February 2009

Pre-Company Development Steps

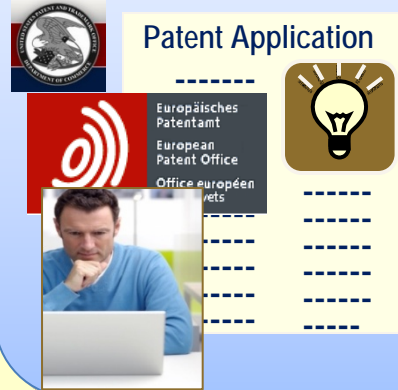
Invention



Identify Product & Market



"IP" Strategy



Initial Business Strategy



Entrepreneur



Proof of Concept



Form Startup

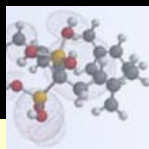
Articles of Incorporation
Shareholder Agreement
License Agreement

Funding & Financing





Investment	Who Paid	Outcome
\$6 million	Fed Agencies & Nonprofits	•Develop cloning and breeding approach
\$30,000	UI	• Patent App
\$50,000 \$400,000 \$1,500,000	UI & GIVF Battelle IDED	<ul style="list-style-type: none"> •Demo Cystic Fibrosis model •Engage Iowa company <i>Trans Ova Genetics Inc.</i> •Identify CEO •Form company-joint venture •Create business model •Raise financing •Create UI license agreement
\$X million (undisclosed)	Private Investors	•Product development



Terpenoid Therapeutics Inc.



Grant Funding

Equity Financing



Invention



"IP" Strategy

Articles of
Incorporation

Form Startup



Proof of Concept



Identify Product & Market



Initial Biz Strategy



Entrepreneur



Funding & Financing



Funding & Financing

Investment	Who Paid	Outcome
\$5 million	Fed Agencies & Nonprofits	•Identify bio pathway & cancer compounds
\$110,000	UI	• Patents
\$10,000	Founders Hohl, Wiemer	•Company incorporated
\$50,000	UI & GIVF	•Animal data
\$8000	UI	•EIR helps founders elucidate opportunity
\$30,000	GIVF	•Business Plan •Financing
\$224,000 \$150,000	NCI STTR IDED Demo	•Preclinical development
In progress	Private Investors	•Move toward clinical trials



Invention



"IP" Strategy



Proof of Concept



Entrepreneur



Identify Product & Market



Form Startup



Initial Biz Strategy



Funding & Financing

Investment	Who Paid	Outcome
\$17 million	Fed Agencies & Companies	<ul style="list-style-type: none"> • Develop human simulation software approach
\$5,000	UI	<ul style="list-style-type: none"> • Copyright • Patent Application
\$400,000	Battelle	<ul style="list-style-type: none"> • Develop software modules • Identify CEO • Form company • Develop initial business model • Apply for IDIED Demo funds • Create UI license agreement
\$150,000 (in progress)	IDIED Demo Fund	<ul style="list-style-type: none"> • Secure first customer




Voltesla Inc.

 Invention

 "IP" Strategy

 Identify Product & Market

 Entrepreneur

 Initial Biz Strategy

 Form Startup

 Proof of Concept

Investment	Who Paid	Outcome
\$2.5M	Fed Agencies & Companies	• Magnetic particle inventions
\$750,000	UI	• Patent portfolio
\$15,000	GIVF	• Detailed patent, product, market assessment
\$30,000	GIVF	• Define first product, proof of concept plans, test vehicle, hire product expert, design tests, order equipment
\$2000	UI	• Incorporate company
\$25,000 allocated	GIVF	• Execute proof of concept tests

Definitions

- ✦ **IP = Intellectual Property** created at the University of Iowa such as patents and software copyrights as a result of federally funded research
- ✦ **EIR = Entrepreneur-In-Residence:** a seasoned entrepreneur/CEO/investor who spends time at UI helping to find and develop companies
- ✦ **NCI = National Cancer Institute**
- ✦ **STTR = Small Business Technology Transfer:** this is a federal grant program administered through various agencies for funding to startups
- ✦ **IDED Demo = the IDED Demonstration Fund**, which provides proof of concept funding at the pre-product stage of development
- ✦ **GIVF = the Grow Iowa Value Fund** allocation to the UI for technology commercialization (\$2M annually, matched by the UI)
- ✦ **Battelle = grant funding allocated to the University of Iowa** as a result of the tobacco settlement and slated for use in technology commercialization as per the recommendations of the study done by Battelle (one time payment to UI)

Contact Information

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Terpenoid Therapeutics, Inc.

Drug Discovery and
Development Company

Focus on Cancer and
Osteoporosis

Terpenoid Therapeutics, Inc.

Team

15 year collaboration between Hohl and Wiemer

Science

Isoprenoid (Terpene) Pathway

Intellectual Property Protection

Disclosures/Patents

Articles of Incorporation

Motivated Founders

Institutional Resources

University of Iowa VPR / UI Research Foundation

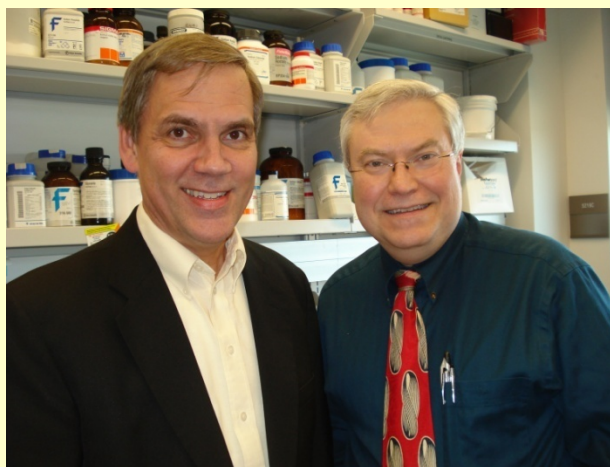
Community Resources

State of Iowa / Federal Government / Private Investors

Corporate Growth

Recruiting Experts

Terpenoid Therapeutics, Inc.



Professors Wiemer and Hohl

Ray Hohl, M.D., Ph.D.

Oncologist/pharmacologist; expert on
biology of terpene metabolism

David Wiemer, Ph.D.

Chemist/pharmacologist; expert on
phosphorous and terpene chemistry

Terpenoid Therapeutics, Inc.

- 1978 - Wiemer joins U of Iowa
- 1991 - Hohl joins U of Iowa
- 1993 - Hohl and Wiemer start collaboration
- 1999/2000 - Co-founders (students) join group
- 2004 - Initial patents filed (granted 2007)
- 2005 - Terpenoid Therapeutics Inc.
- 2006 - Grow Iowa Values Fund and UI (\$50K)
- 2007 - NIH Phase 1 STTRs (\$224K) – UI Research Park's BioVentures Center
- 2008 - CEO named, Iowa Demonstration Fund (\$150K)
- 2009 - Pending STTR Phase 2 (\$841K), SBIRs Phase 1 (\$239), seed investors (\$1.5M)

Terpenoid Therapeutics, Inc.

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